

AMENDMENTS TO THE CLAIMS:

Please cancel claims 27-31 without prejudice or disclaimer:

1. (Currently Amended) A method of patterning a magnetic thin film, comprising:
~~transforming using a chemical transformation of a portion of the magnetic thin film to transform said portion to be non-magnetic and electrically insulating using a chemical transformation.~~
2. (Currently Amended) The method of claim 1, further comprising:
~~using photolithography to provide providing a mask over said portion of the magnetic thin film to be preserved using photolithography.~~
3. (Original) The method of claim 2, further comprising:
converting said portion of said magnetic thin film by a reactive plasma.
4. (Original) The method of claim 1, wherein said using said chemical transformation comprises using a fluorine-based reactive plasma.
5. (Currently Amended) The method of claim 4, wherein said fluorine-based reactive plasma comprises any of NF₃, CF₄, SF₆, and CHF₃.
6. (Original) The method of claim 3, wherein a pressure used in said converting is within a range of about 10 mT to about 30 mT.

7. (Currently Amended) The method of claim 3, wherein said portion of said magnetic thin film comprises any of Ni_{0.8}Fe_{0.2} Permalloy™, and alloys of nickel, iron, and cobalt, and said converting comprising converting said any of Ni_{0.8}Fe_{0.2} Permalloy™ and alloys of nickel, iron, and cobalt, to a fluorine-containing film.

8. (Original) The method of claim 7, wherein said fluorine-containing film is non-ferromagnetic.

9. (Original) The method of claim 7, wherein said fluorine-containing film non-magnetic.

10. (Original) The method of claim 7, wherein said fluorine-containing film is electrically insulating.

11. (Original) The method of claim 2, wherein said mask comprises a photoresist.

12. (Original) The method of claim 2, wherein said mask comprises a hard mask patterned layer comprising one of diamond-like carbon (DLC), TiN, and TaN.

13. (Currently Amended) The method of claim 1, further comprising:
producing a functioning magnetic device.

14. (Original) The method of claim 1, wherein said using said chemical transformation is performed at room temperature.

15. (Original) The method of claim 3, wherein said reactive plasma includes a fluorocarbon.
16. (Original) The method of claim 3, wherein said reactive plasma includes argon.
17. (Original) The method of claim 3, wherein said reactive plasma includes sulfur hexafluoride.
18. (Original) The method of claim 3, wherein said reactive plasma includes bromide.
19. (Original) The method of claim 4, wherein a pressure is selectively employed for said plasma sputtering such that the magnetic thin film material is substantially free of erosion.
20. (Original) The method of claim 3, further comprising:
 - forming an insulating layer over the converted portion of said magnetic thin film and said mask; and
 - etching said insulating layer and said mask to planarize an upper level of the mask and the insulating layer.
21. (Original) The method of claim 20, further comprising:
 - selectively etching said mask; and
 - forming a conductive material over the insulating layer and an area where the mask was selectively etched.

22. (Original) The method of claim 3, wherein said mask comprises an insulating hard mask, said method further comprising:

after said converting, selectively etching said insulating hard mask to pattern said insulating hard mask.

23. (Original) The method of claim 22, further comprising:

forming a conductive material over an area where the insulating hard mask was etched.

24. (Original) The method of claim 3, wherein said reactive plasma includes O₂ and a fluorine-containing gas.

25. (Original) The method of claim 3, wherein said magnetic thin film includes a magnetic tunnel junction (MTJ), and

wherein after said converting said portion, edges of the magnetic tunnel junction have no exposure to oxygen.

26. (Original) The method of claim 25, wherein an edge smoothness of the MTJ is determined by a line edge roughness of the mask.

27-31. (Canceled)